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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/528,788	03/17/2000	Ruediger Paschotta	FREIP030US	5723
21121	7590	05/06/2004	EXAMINER	
OPPEDAHL AND LARSON LLP			RODRIGUEZ, ARMANDO	
P O BOX 5068			ART UNIT	
DILLON, CO 80435-5068			PAPER NUMBER	
			2828	

DATE MAILED: 05/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/528,788

Applicant(s)

PASCHOTTA ET AL.

Examiner

Armando Rodriguez

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 72-107 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 88-91 and 102-107 is/are allowed.
- 6) ☒ Claim(s) 72,73,76-85,87,92-96 and 98-101 is/are rejected.
- 7) ☒ Claim(s) 74,75,86 and 97 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments, see pages 10 and 11, filed February 9, 2004, with respect to the rejection(s) of claim(s) 72-107 under 35 USC 112 second paragraph and under 35 USC 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Alfano et al (PN 4,464,761).

Response to Amendment

The 35 USC 112 second paragraph of claims 72-107 has been withdrawn based on applicant's amendment filed on February 9, 2004.

Claims 1-71 have been canceled and claims 72-107 are pending.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 78,79,99 and 100 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 78,79,99,100 recite the limitation "said thin-disk gain medium" in line 2. There is insufficient antecedent basis for this limitation in the claim. Applicant has not defined the solid-state laser gain medium, as a thin-disk gain medium.

Therefore, the examiner will give the solid-state laser gain medium its broadest interpretation.

Claim Objections

Claim 81 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. It is not clear if claim 81 incorporates the saturable absorber with the kerr lens mode locking.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 72,76,77,85,87,92,93,96,98,101 are rejected under 35 U.S.C. 102(b) as being anticipated by Alfano et al (PN 4,464,761).

Alfano et al describes a high intensity mode locked pulse laser system.

Regarding claims 72,76,92,93

Figure 5 illustrates a passive mode locked laser resonator having mirrors (39) and (45) forming the resonator disposed within the resonator is a laser gain medium (33) being pumped by source (35) at one end and being cooled by cooling system (49) at the other end; passive mode-locking is provided by saturable absorber (41) arranged within the resonator, thereby obtaining a laser system with high intensity short pulses as described in column 8 lines 3-28 and the abstract.

Regarding claim 77,98,

The laser medium does support short pulses, as described in column 8 lines 3-28 and the abstract.

Regarding claim 85,96,

Column 7 lines 26-37, describes the pumping source as a laser.

Regarding claim 87,101,

The saturable absorber will provide Q-switching effects.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 72,73,78-84,92,94,95,99,100 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weingarten et al (PN 5,987,049) in view of Stingl et al (PN 6,345,061).

Regarding claims 72,73,78,79,92

Weingarten et al illustrates in figure 4 a pulsed mode locked optical resonator having a laser gain medium (2) composed of Ti:sapphire, a semiconductor saturable absorber (11) within the resonator for passive mode locking.

Weingarten et al does not disclose a thin plate laser gain medium with cooling means.

Stingl et al illustrates in figure 1 a short pulse laser system having a laser gain medium (4) composed of Ti:sapphire structured as a thin plate with a cooling body (10) as illustrated in figure 3 and described in column 6 lines 30-40.

Therefore, it would have been obvious to a person ordinary skill in the art at the time of the invention to modify the laser system of Weingarten et al with the laser gain medium of Stingl et al because it would provide an effective removal of heat from the gain medium thereby improving the output power of the pulse laser.

Regarding claim 80,

Saturable absorber (11) of Weingarten et al is a mirror type saturable absorber, column 4 lines 35-45.

Regarding claim 81,

Stingle provides Kerr lens mode-locking as described in column 5 lines 36-51.

Regarding claims 82,83,94

Figure 4 of Weingarten et al does illustrate a pair of prism (16,17) for dispersion compensation.

Regarding claim 84,95,99,100,

The repetition rate is obtain by design preferences, as suggested by Stingl et al in column 1 lines 17-33, where the repetition of the laser system is obtain in accordance with the length of the resonator, therefore Stingl et al has disclosed the general conditions to obtain a particular repetition rate, which would have been obvious to a person having ordinary skill in the art to design the resonator for providing a repetition

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rate less 100MHz because Stingl et al has provided an example of obtaining a repetition rate of 75MHz.

Allowable Subject Matter

Claims 88-91 and 102-107 are allowed.

The following is an examiner's statement of reasons for allowance:

After reviewing applicant's amendment, arguments and conducting an updated search none of the cited prior arts alone or in combination discloses the claimed laser having the recited limitations of independent claims 88,102 and 106, where a frequency converted passively mode-locked high intensity output pulse is obtained.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Claims 74,75,86 and 97 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

None of the prior arts alone or in combination provide a gain medium with a reflective end face as recited in claims 74 and 75 along with all recited limitations of the base and intervening claims.

None of the prior arts alone or in combination provide means for cavity dumping as recited in claims 86 and 97 along with all recited limitations of the base and intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Armando Rodriguez whose telephone number is 571-272-1952. The examiner can normally be reached on flex / M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Wong can be reached on 571-272-1834. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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